basal curve, becoming broadly, triangularly reflected above, more than half concealing the umbilicus. Height 29 mm., diam. 33.5 mm.; 4 whorls.

From a small canyon near Ft. Davis, Davis Mountains, Texas. Type 164095 ANSP., collected by Prof. E. P. Cheatum. Paratypes in his collection.

Of the other species described from the Davis Mountains, *H. palmeri* Clench & Rehder is distinctly granulose throughout the last whorl except around the umbilicus. It is also much smaller, and the bands are subequal. In *H. ferrissiana* Pils. the last whorl is more depressed, the aperture more oblique, the middle band as wide as its fellows, and there is no granulation.

WEST AMERICAN SPECIES OF GONIOBASIS, WITH DESCRIPTIONS OF NEW FORMS

JUNIUS HENDERSON

Mrs. Henderson and I have collected *Goniobasis* at many localities in the Pacific States, and have spent a great deal of time in critically studying the large collections of them in the University of Colorado Museum and at Stanford University (especially the Hemphill and Hannibal collections), representing altogether about 200 localities. This study has led to the following conclusions:

1. Typical *Goniobasis silicula* (Gould) seems to be confined to western Washington, though material from Oregon and even California has been reported under that name by myself and others, through lumping with it several recognizable named forms. *G. s. bairdiana* Lea appears to be the prevailing form of this species in northwestern Oregon, usually easily distinguished. *G. s. rudens* Reeve is a recognizable variety, apparently represented by some of Hemphill's material from Olympia, at Stanford University.

2. *G. silicula shastaensis* Lea was originally described as having come from the Shasta and Scott Rivers, California, and Fort Umpqua, Oregon. I have seen no *Goniobasis* from the Scott River, and none from the Shasta River or the Klamath drainage that fits the description and figure of *shastaensis,* but we have

obtained material from Roseburg and other localities in the Umpqua drainage that conforms to both the description and the figure. I sent to the United States National Museum specimens from the Shasta, Klamath and Umpqua Rivers, for comparison with the types. They were submitted to Dr. Harald Rehder, who wrote, June 27, 1934: "The type of *Goniobasis shastaensis* Lea, together with twenty-two paratypes, bears the label: Scott and Shasta River, California, the specimens have been received from Dr. Trask. These specimens, as the photographs show, are different from the specimens that you sent us from the Shasta and Klamath Rivers, and are more like those from the Umpqua River. We had nothing in our collection like the specimens from the Shasta and Klamath Rivers. Most of the specimens from the type lot are indistinguishable from the Umpqua River material; they are, however, generally somewhat larger in size. Lea's specimens from Fort Umpqua are like your Umpqua River specimens, except that they have for the most part a more mahogany color. Whether Lea's type lot (from Scott and Shasta Rivers) really came from either or both of those rivers, or whether we are here dealing with a confusion of localities, I cannot tell."

Several years ago I had given to my Shasta River material the name *G. yrekaensis,* and prepared a description, which I include in this paper.

3. *G. plicifera* Lea occurs in northwestern Oregon and southwestern Washington. *G. oregonensis* Tryon and *bulimoides* Tryon intergrade interminably with typical *plicifera,* and were apparently abandoned by Tryon soon after he described them, yet many specimens may be easily assigned to one or the other, and the names may be worth retaining in a varietal sense.

4. *G. draytonii* Lea, described from Astoria, Oregon, and Walla Walla, Washington, and reported by Tryon from Sacramento Valley, California, we have tentatively identified from a number of northern California localities, but we have seen only two lots from the Columbia drainage that can possibly be referred to this species.

5. We have not recognized *G. bulbosa* (Gould), *newberryi* Lea nor *rubiginosa* Lea in the collections, unless, as has been sug-

gested, *circumlineata* from Sacramento Valley, is a synonym of one of them.

6. *G. acutifilosa* Stearns, *G. a. siskiyouensis* Pilsbry, and *G. occata* (Hinds), have been found only in California. *G. occata* from near Antioch, in the Hannibal and Hemphill collections at Stanford University, furnishes the most southerly record for the genus in the Pacific States, unless the uncertain type locality of *circumlineata* is the Mission San Antonio in Monterey County.

Goniobasis has been reported from "Vancouver Island (Forbes)? British Columbia in the streams west of the Cascades (Lord)." I have seen none from north of the southern portion of Puget Sound, in any of the collections examined, and have not found anyone else who has seen any. Which proves what?

Goniobasis hemphilli, new species. Plate 4, fig.1.

Shell of medium size, somewhat resembling *G. silicula* (Gould), but is decidedly flat-sided, evenly pyramidal, and divergence of the spire is greater; surface dull or very slightly shiny; color light to dark brown or horn; whorls 8 or 9, scarcely convex, usually slightly, slopingly, but sometimes sharply shouldered; suture well impressed, sometimes V-shaped; 5 to 7 upper whorls bear about 10 or 12 axial plicae, not so prominent as is usual in *G. silicula;* spiral sculpture variable, not pronounced, but visible on all whorls; in some examples the spirals on the upper whorls consist of a few impressed lines separating broader flat bands, in others, faint thread-like ridges, sometimes as many as 12 or 13, often crossed by faint sculpture paralleling the growth lines, giving the surface a slight beaded appearance; some specimens have a faint peripheral darker band, and two color bands sometimes show in the aperture, the stronger one at the base.

Holotype, largest specimen examined, from near Portland, Oregon, in the Hemphill collection in the University of Colorado Museum, No. 21167-a: Alt. 24.5 mm.; diam. 9 mm. Figured paratype, same collection, No. 21167-b: Alt. 22 mm.; diam. 8.5 mm. There are many topotypes in the same Museum, and in the Hemphill collection at Stanford University, nearly all practically perfect and quite uniform in size and color. This species is much less rugose than *silicula,* with which it has been confused, apical plications weaker, sides of whorls flatter and spiral sculpture different. From *G. bairdiana* Lea, occupying northwestern Oregon, it differs in its lighter color, sculpture and much greater apical divergence. I have seen it only from the Portland locality.

Goniobasis hemphilli dallesensis, new subspecies. Plate 4, fig. 2.

Similar to *G. hemphilli* in form, size and sculpture, but greenish or brownish yellow, rather than brown, entirely without color band, surface slightly shiny, and most of the large lot slightly more slender. Holotype, from Mill creek, The Dalles, Oregon, University of Colorado Museum, 16016-a: Alt. 19 mm., a little broken from the tip; diam. 7 mm. Paratype, largest specimen examined, same collection, No. 16016-b: Alt. 22 m., apex missing, original altitude probably about 24 mm.; diam. 9 mm. Figured specimens, same collection, No. 16016-c. I have seen this only from the type locality, where it was abundant.

Goniobasis hemphilli maupinensis new species.

Shell much like *hemphilli* in shape and sculpture, but somewhat larger, more solid, uniformly much darker in color (dark olive brown, with a darker peripheral band), and the aperture is purple within, including the columella. In *hemphilli* and *dallesensis* the columella is white and the aperture white within. The surface of *hemphilli* is dull or but very slightly shiny, that of *dallesensis* more shiny and that of *maupinensis* still more so. The spiral sculpture is more irregular than in the other two forms, in many examples a few very sharp spiral striae standing out more prominently than the others, with flattened bands between, as in some specimens of *circumlineata.* The apex is missing from all specimens, but the earliest whorls present show the axial plicae as in *hemphilli.* Holotype, Univ. Colo. Museum. No. 17754-a: Alt. 23 mm. (original alt. probably about 28 mm.); diam. 9.5 mm. Paratype, largest specimen seen, No. 17754-b: Alt. 27 mm. (original alt. probably about 35 mm.); diam. 10 mm. Type and only locality, Deschutes River, Maupin, Oregon.

Goniobasis yrekaensis new species. Plate 4, figs. 3, 4.

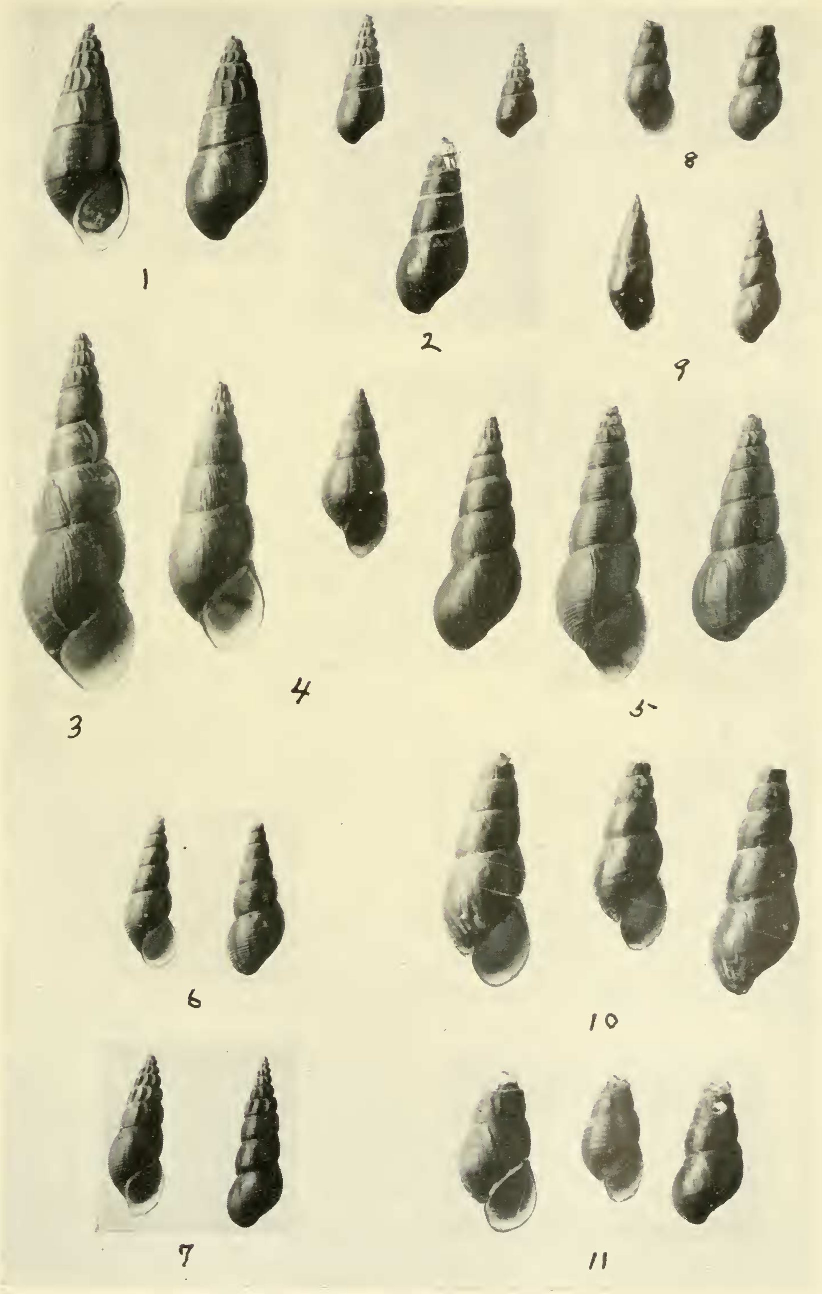
Shell rather large, robust, less slender than *shastaensis* Lea; surface dull; color very light yellowish brown to darker brown, upper whorls usually brown, that color extending downward as a broad, dark band on some of the lower whorls; whorls 9 or 10, not very convex; suture well impressed; upper 4 or 5 whorls bear about 12 to 15 weak but regular axial plicae; lower whorls on most specimens covered with low, fine, rounded riblets, parallel with growth lines, giving to the surface a roughened appearance; 6 or 8 upper whorls spirally striate, the striae usually becoming more or less obsolete on the lower three whorls, but sometimes the whole shell beautifully and finely striate; outer lip sinuous, bending a little forward toward the base, giving the shell a slightly beaked appearance; aperture about one-third the total length, white within, sometimes exhibiting the brown spiral band.

Holotype, Univ. Colo. Museum No. 17735-a: Alt. 39 mm.; diam. 11.5 mm.; aperture 11 mm. long, 8 mm. wide. Figured paratypes No. 17735-b. These are from a fine lot obtained by us in Shasta River, Calif., about 4 miles above the mouth, below Yreka. We found it also two miles east of Talent, at Grant's Pass in Rogue River, and in Deer Creek, southwest of Grant's Pass, all in Oregon, and received from Allyn G. Smith specimens obtained in Rogue River at Prospect, Ore. We obtained very fine specimens with greenish periostracum in Klamath River, 4 miles east of Klamath, and a slender form in Smith River, 9 miles northeast of Crescent City, both in California, and the West Fork of Illinois River, southwest of Grant's Pass, Oregon. Specimens from Klamath River, near Oak Flat Creek, Siskiyou Co., Calif. (Allyn G. Smith), are not quite typical. Greenish specimens, not quite mature, from Rogue River at Agnes, Ore., are in the Hannibal collection at Stanford University. Small specimens from a rivulet on Jelly Ferry road, below the Junction with Red Bluff-Manton road, California (Hannibal, Stanford University), resemble this species in color and general appearance, but the spiral sculpture and axial plicae are absent from the upper whorls.

Goniobasis yrekaensis obscura, new subspecies.

Closely related to *G. yrekaensis,* but shell uniformly smaller, more slender, and of very much darker color—dark brown or reddish brown, sometimes nearly black; sometimes with a broad, very dark band on the periphery, somewhat lighter above and below; usually two broad, dark red bands showing within the aperture. This well marked form we found in abundance in a creek two miles southwest of Wonder, Oregon, and have received from E. P. Chace a lot labelled "near Wonder, Ore.," perhaps the same creek. I have seen it from no other locality.

Holotype, University of Colorado Museum, No. 17724-a, 2 miles S.W. of Wonder: Alt. 20 mm. (apex missing, original alt. probably about 23 or 24 mm.); diam. 8 mm. Most specimens are



Junius Henderson: West American species of *Goniobasis*.